

REMARKS/ARGUMENTS

Favorable reconsideration of this application is respectfully requested.

The specification is amended by the present response to correct minor informalities therein, to address the objection to the drawings noted in paragraph 3 of the Office Action, and to address the objection to the specification noted in paragraph 5 of the Office Action.

More particularly, the amendments to the specification correct minor informalities, and now the specification refers to step S4 shown in Figure 3 and element 25 shown in Figure 4. Thus, the specification now refers to all elements in the drawings, and thereby the objection to the drawings noted in paragraph 3 of the Office Action is obviated by the present response. The specification also addresses the objections noted in paragraph 5 of the Office Action.

With respect to the objection to the drawings noted in paragraph 4 of the Office Action, a replacement Figure 3 is submitted herewith that properly spells the term "Three-Dimensional" in steps S3 and S5.

Claims 1-34 are pending in this application. Claims 21-34 are added by the present response. No new matter is added.¹

Claims 1, 4, 5, 10, and 12-20 were rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. patent 6,038,074 to Kitaguchi et al. (herein "Kitaguchi") in view of U.S. patent 6,639,685 to Gu et al. (herein "Gu") and U.S. patent 6,765,606 to Iddan et al. (herein "Iddan"). Claims 2, 3, 6, 7, 8, 9, and 11 were rejected under 35 U.S.C. § 103(a) as unpatentable over Kitaguchi in view of Gu and Iddan and further in view of U.S. patent 6,369,899 to Hamada.

Addressing the above-noted rejections, those rejections are traversed by the present response.

¹ The subject matter of new dependent claims 21-34 is believed to be fully supported by the description on pages 38 and 39 of the original specification, as examples.

Initially, applicants note several of the claims are amended by the present response to make clarifications in the language therein. The claim amendments are not believed to raise any issues of new matter.

A brief review of the present disclosure is provided. According to the present disclosure, the present invention is directed to a technology for measuring a three-dimensional shape of an object. To achieve such an objective, the present disclosure sets forth that a pattern light can be applied onto an object from each of a first viewpoint and a second viewpoint, and from results thereof a three-dimensional coordinate (three-dimensional data) of the object can be calculated for each viewpoint. Such results of the three-dimensional data from each of the viewpoints can then be utilized to compose a single coordinate shape. As a result, a three-dimensional shape can be measured with a high accuracy by a relatively simple configuration.

Each of independent claims 1, 5, 7, 13, 15, 16, and 20 recites features of expressing a three-dimensional coordinate of each of points of an object for at least two different positions, and thereby producing a composed image. Such claimed features are believed to clearly distinguish over the applied art.

In contrast to the claimed features, the primary reference to Kitaguchi discloses a motion detecting part 2 provided for detecting an attitude angle change and a viewpoint position change, and then the following operation is carried out, as shown in Figure 19 of Kitaguchi. An output target plane image is taken twice from a first viewpoint and a second viewpoint in such a manner that a part is overlapped. A three-dimensional position of each feature point is obtained as a result of the feature points and corresponding points extracted from the thus-taken images. Based on the three-dimensional position of each of the plurality of feature points, a plane equation is calculated as information of a plane on which each feature point exists, with the use of a least squares method or such. Further, based on the

attitude change and the viewpoint change detected by the motion detecting part and the plane equation thus calculated, each image is projected on a same plane, and the respective images taken from the plurality of viewpoints are composed.

The outstanding Office Action refers to step S5 in Figure 5 of Kitaguchi to indicate correspondence to the claimed “three-dimensional coordinate calculating part”. However, in that respect applicants note that disclosure in Kitaguchi merely obtains a coordinate of a point on an object with the use of results taken from two different viewpoints as shown in steps S3 and S4 of Kitaguchi. Such operations in Kitaguchi are not directed to applying pattern light for each of a first viewpoint and a second viewpoint, then calculating a three-dimensional coordinate for each viewpoint, and then combining such into a single coordinate shape. Thus, the concept in Kitaguchi differs from that in the claimed invention.

The outstanding Office Action also references steps S109 and S110 in Figure 19 in Kitaguchi to correspond to the claimed “three-dimensional shape composing part”. However, in that respect applicants note Kitaguchi merely projects images taken from two viewpoints on a same image plane. Such an operation in Kitaguchi differs from the claimed invention in which, for each viewpoint, a three-dimensional coordinate is calculated, and therefrom a composed image is produced as a result of a composition being carried out in a single coordinate shape.

In such ways, the above-noted claims as currently written are believed to clearly distinguish over Kitaguchi.

With respect to independent claim 10, and the claims dependent therefrom, applicants submit those claims also distinguish over the applied art.

First, applicants respectfully submit the applied art does not disclose “a projecting part applying light having a predetermined pattern onto the object”. Further, according to claim 10 both the image information and corresponding position information specifying the

position at which the image was taken are stored. Such features are believed to distinguish over the applied art.

In that respect applicants also point out that in Figure 19 in steps S102 and S104 in which first and second image data is stored in Kitaguchi, Kitaguchi does not appear to disclose specifically storing therewith position information.

In such ways, independent claim 10, and the claims dependent therefrom, also distinguish over Kitaguchi.

Moreover, none of the further cited secondary references to Gu, Iddan, or Hamada are believed to overcome the above-noted deficiencies in Kitaguchi.

Applicants also note new dependent claims 21-34 even further define how the three-dimensional shape is composed, which features are believed to even further distinguish over the applied art.

In view of these foregoing comments, applicants respectfully submit the claims as currently written distinguish over the applied art.

As no other issues are pending in this application, it is respectfully submitted that the present application is now in condition for allowance, and it is hereby respectfully requested that this case be passed to issue.

Respectfully submitted,

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